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Syzygium cumini (L.) Skeels., a novel therapeutic agent for diabetes: Folk medicinal and pharmacological evidences

Muniappan Ayyanar[a,*], **Pandurangan Subash-Babu**[b], **Savarimuthu Ignacimuthu**[c]

[a] *Post Graduate and Research Department of Botany, Pachaiyappa's College, Chennai 600 030, Tamil Nadu, India*
[b] *Molecular Biology Research Lab, Department of Food science and Nutrition, College of Food and Agriculture Science, King Saud University, P.O. Box 2460 Riyadh 11451, Saudi Arabia*
[c] *Entomology Research Institute, Loyola College, Chennai 600 034, Tamil Nadu, India*
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Summary
Objectives: During the past few decades numerous folk medicinal and scientific investigations on the antidiabetic effects of jambolan (*Syzygium cumini* (L.) Skeels) have been reported. However no comprehensive evidence-based review is available. Hence this review was aimed to summarize the antidiabetic effects of different parts and active principles of jambolan.
Methods: The review is based on the available electronic literature indexed in the PubMed. The search terms were: *Syzygium cumini*, *Eugenia jambolana*, jambolan, jamun, and java plum with and without antidiabetic effect.
Results: Based on experimental studies and folk medicinal evidences, we summarized an up to date and comprehensive report on the antidiabetic activity of jambolan. The mode of action of some of the parts and active principles is also included. Preclinical and clinical studies suggest that, different parts of this plant especially fruits, seeds and stem bark were reported for promising activity against diabetes.
Conclusions: Till date no review is available for the evidence based preclinical/clinical study of jambolan with its antidiabetic effect. There is an immediate attention need for detailed analysis to identify its active principles. It could be used to produce safer drugs to treat diabetes.

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* Corresponding author. Tel.: +91 9940376005.
E-mail addresses: asmayyanar@yahoo.com, ayyaneri@gmail.com (M. Ayyanar).

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Introduction

Many therapeutic agents have been used for the treatment of diabetes mellitus (DM) before insulin was discovered and several hundred plants have revealed antidiabetic activity.[1] Eventhough, different types of oral hypoglycaemic agents are available along with insulin for the treatment of diabetes, traditional healers around the world heavily depend upon medicinal plants and herbs to treat diabetes.[2] Plant derivatives with hypoglycaemic property have been used in folk medicine around the world from ancient time.[3] The treatment of diabetes with naturally derived agents has the advantage of not causing side effects since they have been in use for centuries without exhibiting toxic symptoms. Also, herbal drugs protect β-cells and reduce out fluctuations in glucose levels.[4]

Ayurveda, the Indian traditional medical system uses many antidiabetic plants with no identified side effects.[5] Some of the plants such as *Acosmium panamense*, *Aegle marmelos*, *Agarista mexicana*, *Allium cepa*, *Allium sativum*, *Artemisia herba alba*, *Astragalus membranaceus*, *Brickellia veronicaefolia*, *Cecropia obtusifolia*, *Coccinia indica*, *Cucurbita ficifolia*, *Equisetum myriochaetum*, *Eugenia jambolana*, *Globularia alypum*, *Glycyrrhiza glabra*, *Gymnema sylvestre*, *Lupinus albus*, *Momordica charantia*, *Nigella sativa*, *Ocimum sanctum*, *Opuntia*, *streptacantha*, *Origanum compactum*, *Panax ginseng*, *Parmentiera aculeate*, *Pueraria lobata*, *Rehmannia glutinosa*, *Taraxacum officinale*, *Trigonella foenum-graecum* and *Vitis vinifera* have been reported with promising antidiabetic activity.[6–10]

Syzygium cumini(L.) Skeels. (*E. jambolana* Lam., Myrtaceae) is one of the widely used plants for the treatment of diabetes by traditional practitioners over many centuries. It is commonly known as jambolan, black plum, java plum, Indian blackberry, Portuguese plum, Malabar plum, purple plum, Jamaica and damson plum. Clinical and experimental studies of jambolan revealed that different parts of the plant especially fruits, seeds and stem bark possess promising antidiabetic activity.

Sagrawat et al.[11] reviewed the pharmacological actions and phytochemical constituents of jambolan but not much attention was given to its antidiabetic efficacy. Various extracts of jambolan possess a range of pharmacological actions *viz.*, antibacterial, antifungal, antiviral, anti-genotoxic, anti-inflammatory, anti-ulcerogenic, cardioprotective, anti-allergic, anticancer, chemopreventive, radioprotective, free radical scavenging, antioxidant, hepatoprotective, anti-diarrhoeal, hypoglycaemic and antidiabetic effects.[12] However, no comprehensive review has been compiled encompassing the antidiabetic efficacy of this plant even though vast number of reports is available in the literature.

Methods

This review is based on the published literature on the antidiabetic effect of jambolan in clinical and experimental studies as well as folk medicinal uses. The electronic literature was limited to the articles indexed in PubMed search. The terms used in search were: *S. cumini*, *E. jambolana*, jambolan, jamun, java plum, Indian blackberry and Malabar